

CLAIMS

1. A driving method of a display device for driving a pixel which is arranged at each of intersections of a plurality of scanning lines and a plurality of data lines, wherein a pixel at each of intersections of particular ones of the plurality of scanning lines and particular ones of the plurality of data lines is set to be in a display state while the remaining pixels are set to be in a non-display state, the particular scanning lines are selected, one line for every horizontal scanning period with a selection voltage supplied to the selected scanning line for one of the two split halves of the one horizontal scanning period, the polarity of the selection voltage is inverted with respect to an intermediate value between a lighting voltage and a non-lighting voltage, supplied to the data line, every two or more horizontal scanning periods, each of the scanning lines other than the particular scanning lines is supplied with a non-selection voltage which is inverted in polarity with respect to the intermediate value every one or more vertical scanning periods, each of the particular data lines is supplied with a lighting voltage in accordance with a content to be displayed on a pixel at an intersection of the selected scanning line and the particular data line, for a period, during which the selection voltage is supplied to the selected scanning line, within one horizontal scanning period for selecting one of the particular scanning lines, the particular data line is supplied with the lighting voltage and the non-lighting voltage for substantially equal periods within the one horizontal scanning period for the selected scanning line, and the data line other than the particular data lines is supplied with the non-lighting voltage for a period during which the particular scanning lines are consecutively selected in response to the polarity of the selection voltage supplied to the selected scanning lines, wherein the polarity of the non-lighting voltage is inverted in synchronization with the period of polarity inversion of the selection voltage.

2. A driving method of a display device according to claim 1, wherein when one of the particular scanning line is selected, the selected scanning line is supplied with the selection voltage for a second half of one horizontal scanning period, and when a subsequent scanning line is selected, the selected scanning line is supplied with the selection voltage for a first half of one horizontal scanning period, and

the supply of the selection voltage alternates between during one half period and during the other half period, every one horizontal scanning period.

3. A driving method of a display device according to claim 2, wherein when the selection voltage is supplied during the second half period, the particular data line is supplied with the lighting voltage from a time point earlier than the end of the second half period by the duration, corresponding to a tonal gradation of a pixel at an intersection of the selected scanning line and the particular data line, till the end of the second half period, and is supplied with the non-lighting voltageduring the remaining time of the second half period, and

when the selection voltage is supplied during the first half period, the particular data line is supplied with the lighting voltage from the beginning of the first half period till a time point later than the beginning of the first half period by the duration corresponding to the tonal gradation of the pixel at the intersection of the selected scanning line and the particular data line, and is supplied with the non-lighting voltage during the remaining time of the first half period.

4. A driving method of a display device according to claim 1, wherein for a duration of time during which the scanning lines other than the particular scanning lines are consecutively selected,

the data lines are supplied with a signal having a positive voltage portion and a negative voltage portion with respect to the intermediate value, the signal alternating between the positive voltage portion and the negative voltage portion with respect to the intermediate value every one or more horizontal scanning periods.

5. A driving method of a display device according to claim 4, wherein the polarity inversion period of the signal having the positive voltage portion and the negative voltage portion is approximately a fraction of the horizontal scanning period, and the fraction is determined by dividing the total number of the scanning lines other than the particular scanning lines by an integer number equal to two or larger.

6. A driving circuit of a display device for driving a pixel which is arranged at each of intersections of a plurality of scanning lines and a plurality of data lines , in which a pixel at each of intersections of particular ones of the plurality of scanning lines and particular ones of the plurality of data lines is set to be in a display state while the remaining pixels are set to be in a non-display state,

the driving circuit comprising a scanning line driving circuit and a data line driving circuit,

5 wherein the scanning line driving circuit selects the particular scanning lines, one line for every horizontal scanning period with a selection voltage supplied to the selected scanning line for one of the two split halves of the one horizontal scanning period, inverts the polarity of the selection voltage with respect to an intermediate value between a lighting voltage and a non-lighting voltage, supplied to the data line, every two or more horizontal scanning periods, and

10 supplies the scanning line other than the particular scanning lines with a non-selection voltage which is inverted in polarity with respect to the intermediate value every one or more vertical scanning periods, and

15 the data line driving circuit supplies the particular data line with a lighting voltage in accordance with a content to be displayed on a pixel at an intersection of the selected scanning line and the particular data line, for a period, during which the selection voltage is supplied to the selected scanning line, within one horizontal scanning period for selecting one of the particular scanning lines, supplies the particular data line with the lighting voltage and the non-lighting voltage for substantially equal periods within the one horizontal scanning period for the selected scanning line, and

20 supplies the data line other than the particular data line with the non-lighting voltage for a period during which the particular scanning lines are consecutively selected in response to the polarity of the selection voltage supplied to the selected scanning lines, wherein the polarity of the non-lighting voltage is inverted in synchronization with the period of polarity inversion of the selection voltage.

25 7. A driving circuit of a display device according to claim 6, wherein when one of the particular scanning line is selected, the scanning line driving circuit supplies the selected scanning line with the selection voltage for a second half of one horizontal scanning period, and

when a subsequent particular scanning line is selected, the scanning line driving circuit supplies the selected scanning line with the selection voltage for a first half of one horizontal scanning period, and

30 the supply of the selection voltage alternates between during one half period and during the other half period, every one horizontal scanning period.

8. A driving circuit of a display device according to claim 7, wherein when the selection voltage is supplied during the second half period, the data line driving circuit supplies the particular data line with the lighting voltage from a time point

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earlier than the end of the second half period by the duration, corresponding to a tonal gradation of a pixel at an intersection of the selected scanning line and the particular data line, till the end of the second half period, and is supplied with the non-lighting voltage during the remaining time of the second half period, and

when the selection voltage is supplied during the first half period, the data line driving circuit supplies the particular data line with the lighting voltage from the beginning of the first half period till a time point later than the beginning of the first half period by the duration corresponding to the tonal gradation of the pixel at the intersection of the selected scanning line and the particular data line, and is supplied with the non-lighting voltage during the remaining time of the first half period.

9. A driving circuit of a display device according to claim 6, wherein for a duration of time during which the scanning lines other than the particular scanning lines are consecutively selected,

the data line driving circuit supplies the data line with a signal having a positive voltage portion and a negative voltage portion with respect to the intermediate value, the signal alternating between the positive voltage portion and the negative voltage portion with respect to the intermediate value every one or more horizontal scanning periods.

10. A driving circuit of a display device according to claim 9, wherein the polarity inversion period of the signal having the positive voltage portion and the negative voltage portion is approximately a fraction of the horizontal scanning period, and the fraction is determined by dividing the total number of the scanning lines other than the particular scanning lines by an integer number equal to two or larger.

11. A display device for driving a pixel which is arranged at each of intersections of a plurality of scanning lines and a plurality of data lines, in which a pixel at each of intersections of particular ones of the plurality of scanning lines and particular ones of the plurality of data lines is set to be in a display state while the remaining pixels are set to be in a non-display state,

the display device comprising a scanning line driving circuit and a data line driving circuit,

wherein the scanning line driving circuit selects the particular scanning lines, one line for every horizontal scanning period with a selection voltage supplied to the selected scanning line for one of the two split halves of the one horizontal scanning period, inverts the polarity of the selection voltage with respect to an intermediate

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value between a lighting voltage and a non-lighting voltage, supplied to the data line, every two or more horizontal scanning periods, and

supplies the scanning line other than the particular scanning lines with a non-selection voltage which is inverted in polarity with respect to the intermediate value every one or more vertical scanning periods, and

the data line driving circuit supplies the particular data line with a lighting voltage in accordance with a content to be displayed on a pixel at an intersection of the selected scanning line and the particular data line, for a period, during which the selection voltage is supplied to the selected scanning line, within one horizontal scanning period for selecting one of the particular scanning lines, supplies the particular data lines with the lighting voltage and the non-lighting voltage for substantially equal periods within the one horizontal scanning period for the selected scanning line, and

supplies the data line other than the particular data lines with the non-lighting voltage for a period during which the particular scanning lines are consecutively selected in response to the polarity of the selection voltage supplied to the selected scanning lines, wherein the polarity of the non-lighting voltage is inverted in synchronization with the period of polarity inversion of the selection voltage.

12. A display device according to claim 11, wherein the pixel comprises a switching element and a capacitive element containing an electro-optical material, and

wherein when one scanning line is supplied with the selection voltage, the switching element of the pixel assigned to the selected scanning line becomes conductive, and writing is performed on the capacitive element corresponding to the switching element in response to a lighting voltage supplied to the corresponding data line.

13. A display device according to claim 12, wherein the switching element is a two-terminal switching element, and the pixel is formed of the two-terminal switching element and the capacitive element connected in series between the scanning line and the data line.

14. A display device according to claim 13, wherein the two-terminal switching element has a structure of conductor-insulator-conductor connected to one of the scanning line and the data line.

15. Electronic equipment comprising a display device according to one of claims 11 through 14.